SECTION 5. ENVIRONMENT

The Automated Data System (ADS) which is required to support the system will be a networked suite of hardware and software deployed world-wide. The ADS must conform to the required architecture of Department of Defense (DoD) directives and standards. Wherever possible, current standard government systems (e.g., Desk Top][[I, etc.), will be procured to satisfy hardware requirements. Commercial-off-the-shelf (COTS) hardware (new or warranted as new) will be employed to satisfy residual requirements. In some cases, current government, hardware may be utilized. Software will be COTS where possible and site licenses will be used where applicable. Any special application software will be developed when commercial products are not available.

Figures 5-1, 5-2, and 5-3 depict the relationships that the Army, Navy, and Air Force identified systems have with the system, respectively. These systems include those required by the Service to be integrated within the design and build of the joint TM system as well as those systems required by the Service to interface to the joint TM system.

Integration entails analyzing each system in terms of the functionality it provides and the data it maintains and ensuring that functionality and data be incorporated within the design of the joint TM system. These systems will run in parallel with the joint TM system during its Test and Evaluation phases and eventually be turned off. It is imperative to note that the Services specified certain systems as requirements for integration within the joint TM system with the intent that integration would mold together the systems' current functionality with their desired enhancements. Systems identified for integration within the joint TM system are located within the bolded rectangle entitled "Joint TM System" on Figures 5-1, 5-2, and 5-3 and are briefly described in Section 5.1. The lines connected to the integrating systems denote current and/or proposed interfaces.

Interfacing entails analyzing each system in terms of the data requirement for the interface. Some interfaces exist today; some interfaces are required for the build of the joint TM system. Current interfaces equate to a data exchange (paper or digital) between an "interfacing system" and an "integrating system." Future interfaces equate to a new data exchange which will enhance that Service's functional capabilities. Systems identified for interfacing to the joint TM system are located outside the bolded rectangle entitle "Joint TM System" on Figures 5-1, 5-2, and 5-3 and are briefly described in Section 5.4. The lines connected to the interfacing systems denote current interfaces which must be replicated in the design of the joint TM system as well as proposed interfaces to the joint TM system.
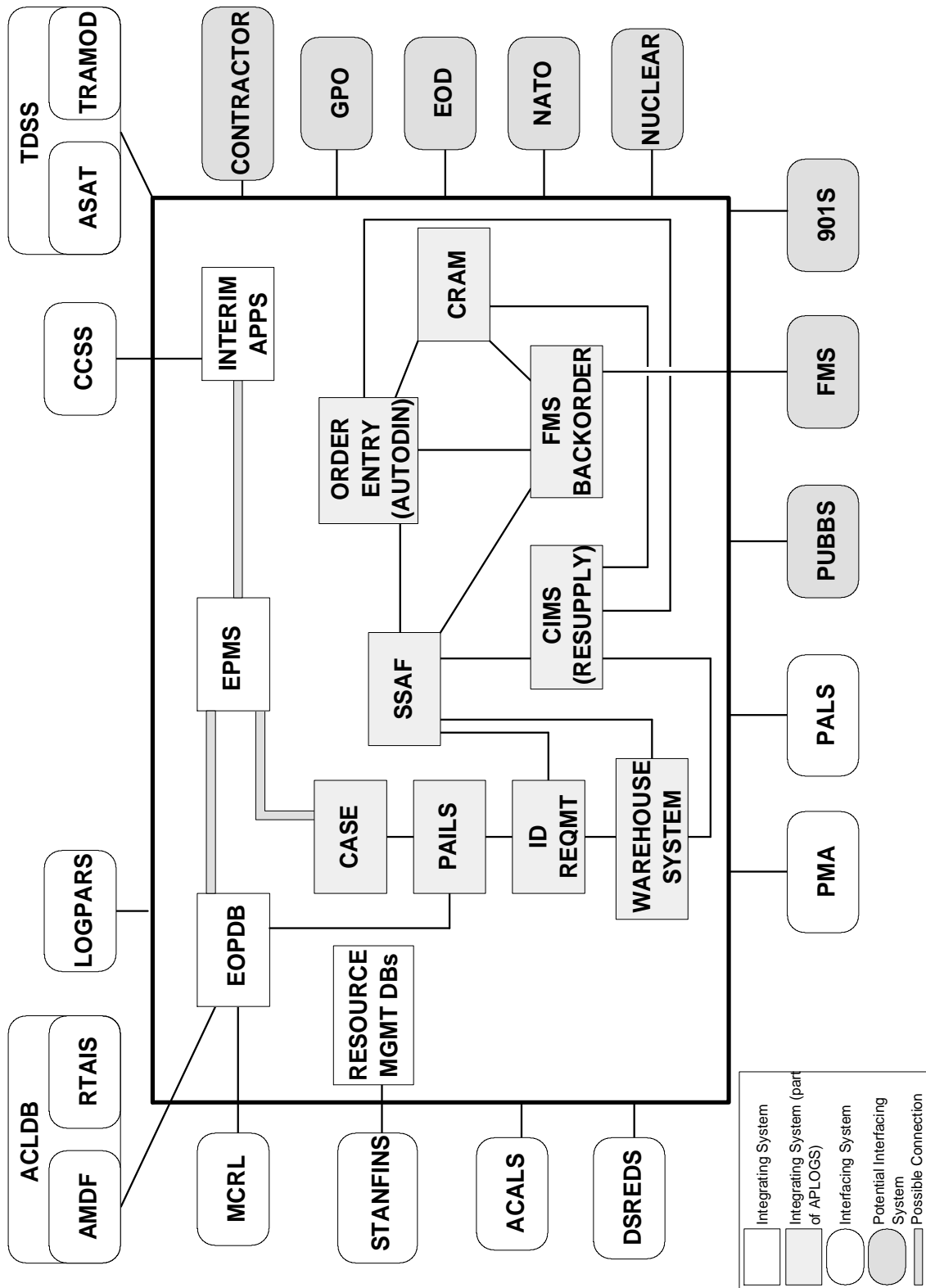
Figure 5-1, Army Systems' Connectivity to the Joint TM System

CONTRACTOR

GPO

EOD

NATO

NUCLEAR

FMS

E-STEPS

M-SPEC

TMPODS

ALPS

EDMICS

PMA

NUBS

ETPS

Supported/Updated System

Interfacing System
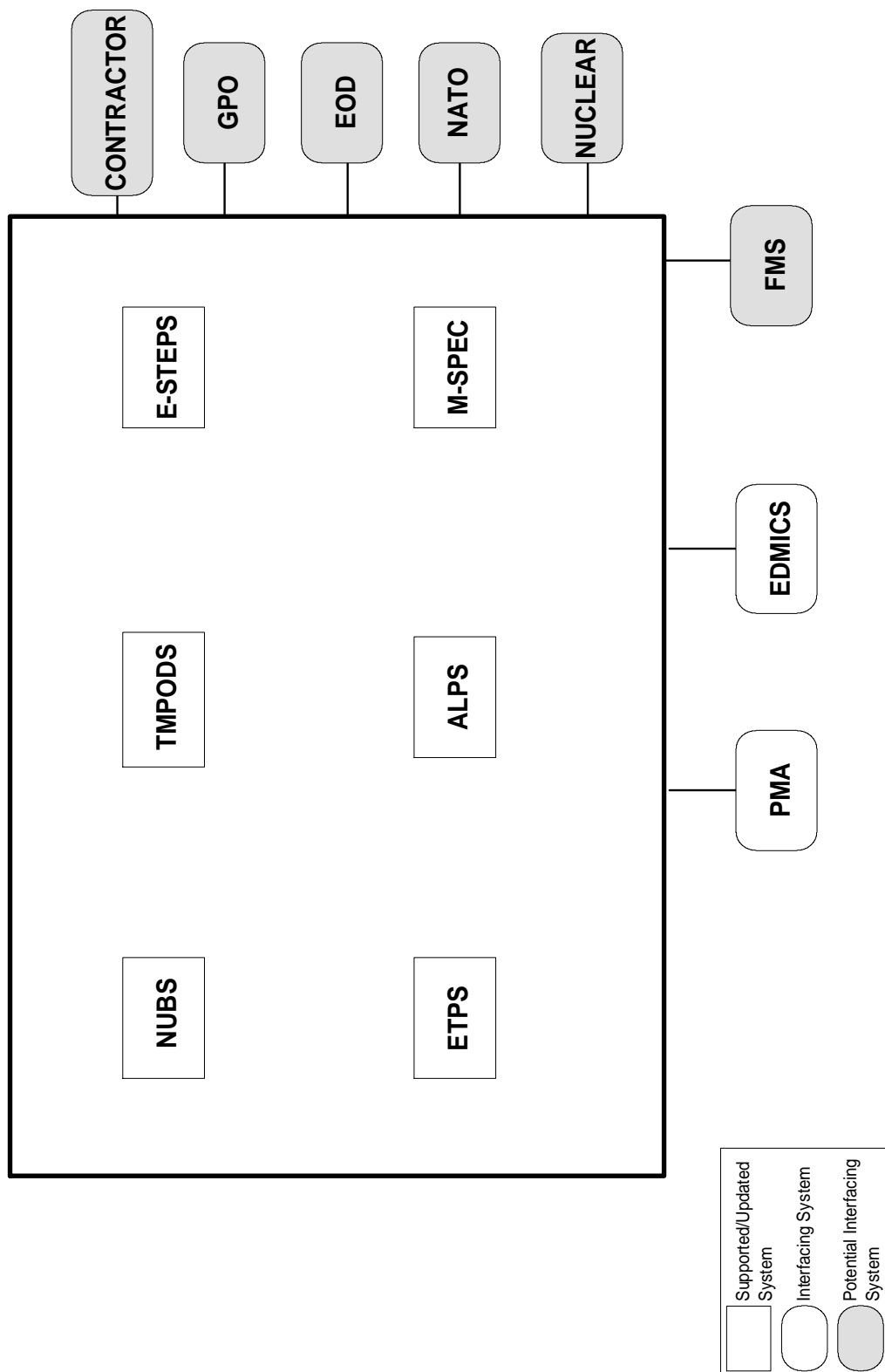
Potential Interfacing System

Figure 5-2, Navy Systems' Connectivity to the Joint TM System
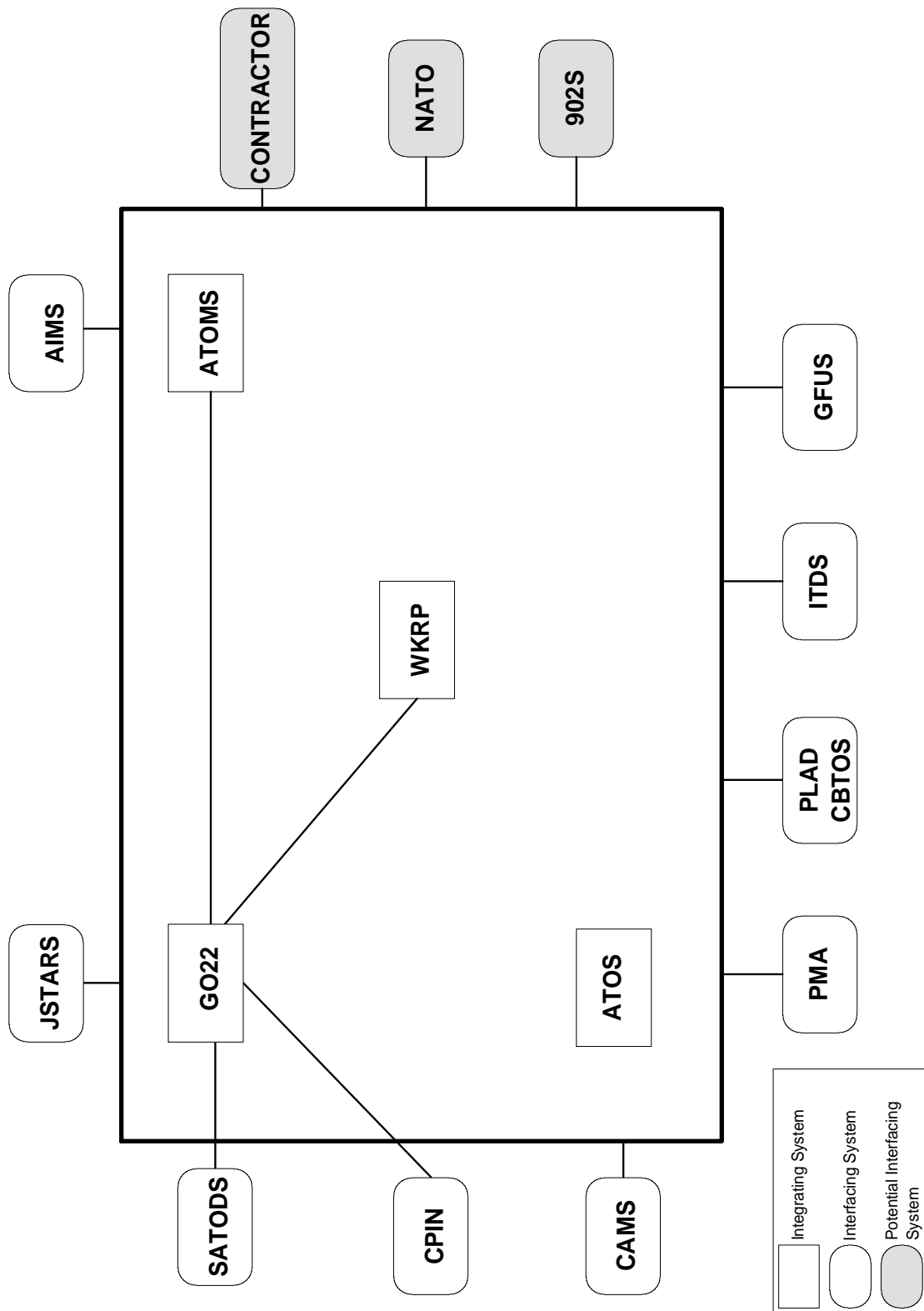
Figure 5-3, Air Force Systems' Connectivity to the Joint TM System

5.1 Equipment and Software Environment.

The following hardware/software systems are currently being utilized by the services to assist in the management of TMs and TM data. It should be emphasized that the environment is in the beginnings of a vast transition as the end product of the joint TM system is shifting from paper manuals to an Interactive Electronic Technical Manual (IETM) data stream. The joint TM system will support multiple TM data streams including paper and various digital formats. The joint TM system will be required to interface with a variety of IETM user display devices. The user displays devices mentioned in this section represent only those that there is a current knowledge of, and there will most likely be many more. The joint TM system will distribute data to these devices, in many cases eliminating the need for costly and time consuming reproduction of hard media such as CD-ROM, or optical disks. In this way, the joint TM system will enable DoD to take fun advantage of the efficiencies made possible through the use of IETM technologies.

5.1.1   Army Existing Hardware/Software.

The following are Army TM related hardware and software systems in development or use whose functional role must be captured during the joint TM system development. In addition, the Army intends to use the joint TM system as a system to support all types of publications [as stated in paragraphs 2.1.1, 2.4., 3.2, and 4.4 of this Functional Description (FD)] will require the capture of other unspecified systems that support training and administrative publications functions. These will be provided during system development efforts.

5.1.1.1 Equipment Publications Management System (EPMS).

The primary objective of EPMS is to provide a management control and reporting system to support the development and maintenance of Army equipment publications.

The Army Communications Electronics Command (CECOM) was tasked by Army Materiel Command (AMC) to develop EPMS with the expectation of it being offered to other Major Subordinate Commands (MSCS) upon its completion. EPMS is currently under version 3.0 development. Version 1.0 was developed by a contractor and found to be inadequate for CECOM's needs. Version 2.0 was developed in-house and is still in use today. Version 3.0 is ready to go on contract. Enhancements to version 3.0 were discussed for inclusion in the joint TM system.

5.1.1.1.1 EPMS Hardware.

     a.   Version 2.0: Intel 310/320
     b.   Version 3.0: AT&T 3B2/60OG

5.1.1.1.2 EPMS Operating System.

     a.   Version 2.0 Xenix OS
     b.   Version 3.0 Unix 5.0

5.1.1.1.3 EPMS Software.

     a.   Version 2.0: Data Flex, Xenix OS
     b.   Version 3.0: Oracle 6.0, C programming language

5.1.1.2   Equipment Oriented Publications Data Base (EOPDB).

EOPDB identifies the published and scheduled publications needed to support the over 23,000 end items listed in Army Supply Bulletin (SB) 700-20, Army Adopted/Other Items Selected for Authorization/List of Reportable Items, and relates the publications to the specific items of equipment (end item and its respective components) they support.

Equipment items in the Army are uniquely identified by National Stock Number (NSN) and Line Item Number (LIN). SB 700-20 provides the cross reference between NSN and LIN.

In addition to equipment publications, some general subject equipment publications, such as painting practices and welding, are also included in various EOPDB management reports. Not yet included as equipment publications are training publications and doctrinal publications.

EOPDB integration shall include associated interfaces. Associated interfaces include the Army Master Data File (AMDF) and the Master Cross-Reference List (MCRL):

5.1.1.2.1 EOPDB Hardware.

    UNISYS 50OO/7O

5.1.1.2.2 EOPDB Operating System.

    UNIX Version V (16 bit to 32 bit change pending)

5.1.1.2.3 EOPDB Software.

     a.   DBMS - ORACLE 5.0
     b.   SQL - SQL Plus

    c.   Report Generator - Pro COBOL

5.1.1.3   Army Publications Logistics System (APLOGS).

The U.S. Army Publications and Printing Command (USAPPC) has undertaken a major program to upgrade existing systems into a state-of-the-art management information system to provide economical, responsive support to its user/customer community. This program will result in establishment of APLOGS. APLOGS will consist of a master data base and related applications software. This system will provide standard terminology throughout the command. A data element dictionary will minimize data redundancy and inconsistencies within the system.

APLOGS will provide automated support for inventory management, initial distribution of published matter, customer requisitioning, replenishment, and catalog maintenance. The current system environment to be covered by APLOGS is described in the following nine subparagraphs.

5.1.1.3.1 Publications Automated Information Locator System (PAILS).

PAILS is designed to support US Army Publications and Printing Command in its mission of production, tracking, and controlling the status of Departmental Publications and all other publications/forms produced by various government agencies or services. PAILS is used by the Army world-wide.

The current status and historical information pertaining to each publication and/or blank form available from various sources, including but not limited to the two Army Publications Distribution Centers (PDCs), are maintained on PAILS. While listing all items stocked and issued by both PDCS, the PAILS data base also lists thousands of items stocked at other Army or government locations.

PAILS was developed using the INQUIRE Data Base Management System (a product of Infodata Systems, Inc., Falls Church, VA). It is maintained on a government owned time sharing computer system operated by the U.S. Department of Justice (USDOJ). This IBM main frame provides both direct line and dial up access via a USDOJ network or TELENET communications service.

This system is not directly interfaced with other USAPPC applications or data bases. However, access to the data maintained in the system is available both through on-line and on batch reports (paper or tape outputs).

PAILS is used to produce the Consolidated Index of Army Publications and Blank Forms (DA Pamphlet 25-30) currently produced

in both 48X microfiche and on a test CD-ROM application.

Because PAILS is not integrated with other USAPPC publication inventory applications, it must be reconciled periodically with the data maintained in the publications inventory to ensure accuracy. Plans are underway to merge these data bases once the rehosting of USAPPC Baltimore Computer Center is accomplished.

Reconciliation between data bases is done by using the Publications Identification Number (PIN) which is assigned by PAILS for each publication/blank form record. The PIN consists of two parts: 1) a basic record number of six numeric positions, and 2) a type change code of three numeric positions (e.g., PIN 012345-000 is for record number 012345 and the 000 indicates basic publication only. If the suffix is 001-999, it indicates a specific change to the publication). The PIN number is also used in the USAPPC Case Management System (CMS).

5.1.1.3.1.1   PAILS Hardware.

IBM 3090 Model 200E.

5.1.1.3.1.2   PAILS Operating System.

IBM MVS/XA
CMS version 5.6

5.1.1.3.1.3   PAILS Software.

DATCOM DB
COBOL 74
IDEAL

5.1.1.3.2 Case Management System (CMS).

CMS is a management tool used by USAPPC to control/track publication reprint purchase orders and manuscripts (cases) and related administrative correspondence through the Publishing, Inventory Management, and Printing Management Divisions of USAPPC. CMS tracks each Request for Printing Publications from the time that it is logged in to the time that is leaves as a print order to the Government Printing Office (GPO).

There are three types of requests for printing publications that may be received: green (centralized printing), red (training and doctrinal), and black (record file copy for USAPPC provided by MSCs having decentralized printing authority).

CMS also uses the PIN number to identify publications. If a PIN does not yet exist for a publication, a temporary PIN will be

assigned. Publications that will require a temporary PIN are new publications and changes to existing publications. Once PAILS has been updated with the new/changed publications, their corresponding PIN will be loaded into CMS. This process is done in batch mode on a weekly basis using a tape sent from USAPPC to Baltimore back to USAPPC.

5.1.1.3.2.1   CMS Hardware.

   IBM 3090, Model 200E

5.1.1.3.2.2   CMS Operating System.

   MVS/XA

5.1.1.3.2.3   CMS Software.

   IDMS/R
   Applications Development System On-line (ADSO)

5.1.1.3.3 Computerized Inventory Management System (CIMS).

   CIMS, in general, supports inventory receiving, warehousing, and shipping operations. The inventory management function of CIMS was extracted from IBM's wholesale IMPACT system. The existing system has undergone extensive modifications since it was adopted as the central resupply system.

   CIMS includes four major functions, which provide the following capabilities:

   a.   Inquiry: allows the Command to query the inventory data by account, item, and due-out (backorder) status and produces a series of reports.

   b.   Initialization: supports the selection and initiation of items meeting specified criteria for incorporation into CIMS.

   c.   Inventory: provides updates for the inventory forecasting, status, and accountability records.

   d.   Demand: provides order handling and shipping functions as well as order maintenance, inventory management, storage control, and similar support functions.

   Information maintenance by the system is available to system users through on-line requests as well as batch reports.

5.1.1.3.3.1   CIMS Hardware.

     IBM 4361

5.1.1.3.3.2   CIMS Operating System.

     DOS-VSE

5.1.1.3.3.3   CIMS Software.

     a. COBOL
     b. Cullinet IDMS/R

5.1.1.3.4 PDC Warehouse Control System.

     The Warehouse System supports two levels of inventory
management at the St Louis PDC. The Bin/Rack System is used to
maintain information on publications stock maintained in loose-
issue warehouse locations. The Bulk Storage system is used to
maintain information on publications stock maintained in bulk
storage, high-rise warehouse locations.

5.1.1.3.4.1   St Louis PDC Warehouse System.

5.1.1.3.4.1.1 Warehouse System Hardware.

     a. IBM 4361
     b. Digital PDP 1184
     c. INTEL 310/286

5.1.1.3.4.1.2 Warehouse System Operating System.

     a. DOS VSE b.
     b. IRMX
     c. RSX-11M-PLUS

5.1.1.3.4.1.3 Warehouse System Software.

     a. COBOL
     b. Cullinet IDMS/R
     c. PASCAL
     d. PDP-11 ASSEMBLER and "C" Manager

5.1.1.3.4.2   PDC Baltimore Warehouse Control System.

5.1.1.3.4.2.1 Warehouse Control System Hardware.

     Hewlett Packard 3000/928

5.1.1.3.4.2.2 Warehouse Control System Operation System.

    MPE XL

5.1.1.3.4.2.3 Warehouse Control System Software.

    a.   COBOL 85
    b.   IMAGE DBMS

5.1.1.3.5 Standard Single Account File (SSAF).

    SSAF maintains account numbers, mailing addresses, and other customer-unique information for each user account. However, this process does not parallel standard Army Logistics Systems performing the same function. The information maintained by this function is accessed by other Publications Center applications to validate customer requisitions or to obtain additional customer data such as mailing addresses for use by those applications. It is also available to system users through on-line inquiry as well as on batch reports.

5.1.1.3.5.1   SSAF Hardware.

    IBM 4361

5.1.1.3.5.2   SSAF Operating System.

    DOS-VSE

5.1.1.3.5.3   SSAF Software.

    a.   COBOL
    b.   Cullinet IDMS/R

5.1.1.3.6 Initial Distribution (ID) Requirements File.

    ID Requirements File supports generation and distribution of copies of new or revised publications and changes to existing publications to users/customers. Several distribution methods are supported, including the following:

    a.   Regular initial distribution: is based on requirements from a specific block on one of the DA 12-series forms as provided by the customer.

    b.   Multiple distribution: is similar to regular initial distribution with the exception that more than one block on a DA 12-series form is specified, requirements from each block are combined, and the highest quantity is issued to the customer.

c.   Standard or Special distribution: is proponent directed distribution based upon the publication proponents knowledge of the intended audience for their publication. It consists of listings of names and addresses of customers established and maintained by the proponent; this distribution method is mutually exclusive of other methods that use the ID requirements or SSAF data files.

d.   Classified distribution: provides for distribution of classified publications according to one or more of the routine distribution methods such as regular, multiple, or special (standard) distribution; to receive a classified publication, an account must pass classification level edits to ensure that the customer is authorized to receive a secret, confidential, or controlled publication.

e.   Recruiting Publicity Item (RPI) distribution: provides for distribution of RPIs to Army recruiters or Army recruiting command accounts based on data in the SSAF.

f.   Printer Initial Distribution (PID): provides for distribution of publications from the printing plant according to one or more of the routine distribution methods such as regular or multiple distribution.

The ID maintenance and inquiry functions are common to both Publications Centers. The distribution functions, however, differ. ID requirements summary data maintained by the system is available via on-line inquiry. An ID validation report is provided for review and modification by users/customers on an annual basis.

5.1.1.3.6.1   ID Requirements File Hardware.

IBM   4361

5.1.1.3.6.2   ID Requirements File Operating System.

DOS-VSE

5.1.1.3.6.3   ID Requirements File Software.

a. COBOL
b. Cullinet IDMS/R

5.1.1.3.7 Customer Requisitioning Accounting Module (CRAM).

CRAM maintains status and historical data concerning all validated and rejected customer resupply requisitions. Information maintained by the CRAM, including that pertaining to

due-outs, is available to system users through on-line inquiry.
In addition, statistical and historical trend information is
provided through batch reporting.

5.1.1.3.7.1   CRAM Hardware.

   IBM 4361

5.1.1.3.7.2   CRAM Operating System.

   DOS-VSE

5.1.1.3.7.3   CRAM Software.

   a. COBOL
   b. Cullinet IDMS/R

5.1.1.3.8 Foreign Military Sales (FMS) Backorder System.

   FMS Backorder System supports foreign military sales
requisitioning, request document review, issues and billing.
This system utilizes publication accounts that begin with the
letter "N". However, the key to this system is the document
number.

   The FMS system includes six functions, all keyed to the
document number of the customers request:

   a.   Requisition input: requests are submitted on DA Form
4569-1-R and include a document number assigned by the FMS
customer.

   b.   Requisition edit: requests are edited and invalid
requisitions are rejected. Notice of the reject is provided to
the customer by a reject error report keyed to the document
number.

   c.   Requisition backorder: when a publication is out of
stock, requests are backordered and a due-out is established for
subsequent shipment Notice of backorder is provided to customer
by an advice of supply action report keyed to document number.

   d.   Requisition issue: requests generate a DD Form 1348
which is the issue document that is sent to the U.S. Army
Publication Distribution Center (USAPDC) directing the picking of
stock and shipment of publication. Notice of the issue is
provided to the customer by an advice of supply action report
keyed to the document number.

   e.   Requisition shipment: the DD Form 1348 is annotated

with shipment data by the PDC.

f.   Requisition billing: annotated DD Form 1348 is input to the system. The system closes out the document number record showing shipment and generates a billing report keyed to the document number. The reports are forwarded to the U.S. Army Security Affairs Command at New Cumberland, PA. They notify the customer of completed actions and control the billing process.

5.1.1.3.8.1   FMS Backorder System Hardware.

IBM

5.1.1.3.8.2   FMS Backorder System Operating System.

DOS-VSE

5.1.1.3.8.3   FMS Backorder System Software.

a. COBOL
b. Cullinet IDMS/R

5.1.1.3.9 Order Entry and File Maintenance System.

The system referred to as the Automated Digital Information Network (AUTODIN) at the Publications center is a front-end processor primarily to the CIMS resupply function, but also the ID requirements function and the SSAF customer account maintenance function. Requests for existing publications and forms, as well as modifications to current ID, resupply requirements, and customer account records are received via the AUTODIN or through the mail. These transactions are entered into the AUTODIN where they are edited. Rejected transactions, as well as data pertaining to accepted transactions, are transmitted to CRAM for maintenance of customer requisition transactions and reject history. Acceptance transactions are transmitted to the appropriate application system.

5.1.1.3.9.1   Order Entry and File Maintenance System Hardware.

IBM 4361

5.1.1.3.9.2   Order Entry and File Maintenance Operating System.

DOS-VSE

5.1.1.3.9.3   Order Entry and File Maintenance System Software.

a. COBOL
b. Cullinet IDMS/R

5.1.1.4   Interim Automated Publications Production System (APPS).

The Army's existing capabilities have been acquired as an interim solution to APPS. Each MSC was given the approval to procure desktop publishing with ATOS-like capabilities. Interim APPS should be functionally compatible with the planned APPS. In terms of planned enhancements for ACAPS, an upgrade of III Page Makeup Equipment System to the CALS-compatible open systems environment is expected. APPS hardware and software configurations at each MSC are as follows:

    a. TROSCOM:
      3 COMPAQ 386/20
      DOS 3.3
      Interleaf Publisher 3.0
      300 MB file server (INTEL) (Compaq 386/25 PC)

    b. AVSCOM:
      8 Zenith 248s (extended)
      3 QM 300 DPI printers
      4 Varityper 600 DPI printers
      1 Kurzweil 300 DPI scanner
      1 Datacomp 300 DPI scanner
      Venture Desktop Publisher (DOS 3.3 compatible)
      dbase III+
      Lotus 1-2-3
      Multimate Advantage

    c. TACOM:
      Digital Dark Room
      Versa CAD
      Super 3-D
      Image Studio
      Super Paint
      Adobe Illustrator 88
      WordPerfect
      54 MACs
      4 Microtex scanners
      4 Verityper VT 600 laser printers
      MAC OS 6.0.3
      Interleaf

    d. CECOM:
      8 Apollo workstations
      1 Hewlett Packard 300 DPI laser printer
      1 Varityper 600 laser printer
      Interleaf Full Technical Publishing Software
      UNIX

    e. MICOM:
      UNISYS 5000/80 with UNIX OS
      PCs and WAN/LAN (PCU)

Xerox Publishing System using:
- Xerox 6085 workstations
- Xerox 4050 and 3700 laser printers

Sun Vector Graphics workstations
Lynx Media Converter
Kurzweil 4000 scanner
Kurzweil 5000 scanner
Imagen 5320 imaging stations
QMS
POS Office (terminals)
Xerox Publisher (XPS)

f. IMMC:
IBM/Clone PCs
Microtek image scanner
Epson laser printer
Epson LQ 2850 24 pin dot matrix WordPerfect 5.0
DrawPerfect
Ventura Publisher

g. CCSLA:
2 Xerox Viewpoint 6085 workstations w/19" B/W monitor
Viewpoint 2.3 Software
1 Xerox laser printer (300 dpi) 4045
1 Xerox 7650 scanner (300 dpi)

h. USAMC CDA
Sun Workstation
Interleaf Publishing Software
UNIX Operating System
MICOM Software
Apple Laser Printer
VSAM Datacom Database
3380 Memory Disk

i. ACAPS Hardware
Source Data Subsystems
1. 12 - IBM 5520 text processing system (12 terminals and CPUS)
2. 31 - IBM PC compatibles
3. 10 Supermicro system (2 CPUS, 20 ports)
4. PRIME minicomputer system Composition Subsystem

2 Interleaf workstations Graphics Subsystem
1. AutoTrol Graphics Software
2. 2 Apollo DN-660 workstations
3. 2 Apollo DN-3000 workstations
4. 2 Digitized Boards
5. 4 Bit Pads
6. Color Hard Copy Printer
7. Plotter
8. Tape Drive

                    File Manager Subsystem
                            1.   2 Apollo DN-4050 workstations
                            2.   1.2 Gigabit storage
                    Output Subsystem
                            1.   Postscript laser printer
                            2.   Linotronic typesetter
                            3.   Videocomp 470 Pagesetter
        j.   ACAPS Operating System.
                    Aegis Operating System
                    MS-DOS Operating System
                    XENIX Operating System
                    Primos Operating System
        k.   ACAPS Software System.
                    AutoTrol System 5000 Software
                    Informix
                    dbase III
                    WordStar
                    Prime Info

5.1.2   Navy Existing Hardware/Software.

     The systems described below support the management of
technical information in the Navy.

5.1.2.1   Naval Publications and Forms Center (NPFC).

     The NPFC shares mainframe resources on an AMDAHL 5890/5990
with other naval commands. This system performs a range of
functions. Generally, the functionality supported by this system
is related to tasks under system management, publish, stock, and
distribution.

5.1.2.1.1 NPFC Hardware.

        a.   AMDAHL 5890/5990 - IBM 3090 equivalent
        b.   Zenith 248 used to emulate 3270
        c.   IBM XT At, PS2 used to emulate 3270
        d.   Dial-up Capability

5.1.2.1.2 NPFC Operating System.

        a.   AMDAHL - MVS/X4
        b.   Z-248 and IBM XT/-MS-DOX

5.1.2.1.3   NPFC Software.

        a.   Splicenet
        b.   IDMS 10.2
        c.   COBOL
        d.   PC Focus and add-ons

e.   IDMS report generator
f.   E-Mail

5.1.2.2   Naval Air Technical Services Facility (NATSF)
           Information Management System (IMS).

     IMS also makes use of mainframe computing capabilities under
the Information Processing Center (IPC) maintained by the
Aviation Supply Office (ASO). The system performs essentially
similar functions as the NPFC system. Generally, the
functionality supported by this system is related to tasks under
system management, stock, and distribution.

5.1.2.2.1 NIMS Hardware.

     AMDAHL 5990-1100

5.1.2.2.2 NIMS Operating System.

     MVS/XA

5.1-2.2.3 NIN4S Software.

a.   IDMS/R
b.   COBOL
c.   IDMS report writer
d.   E-Mail

5.1.2.3   Space and Naval Warfare Systems Command (SPAWAR) -
Configuration Status Accounting (CSA) System.

     The CSA System is under the information processing center
maintained by the SPAWAR Technical Data Center at Naval
Electronic Systems Engineering Center, Portsmouth, VA.
Generally, the functionality supported is oriented toward
providing management information for products managed by SPAWAR.
Major functions include: maintaining SPAWAR equipment
configuration baseline, TM numbering assignment, TM deficiency
analysis, repository functions and providing a master
index/locator of SPAWAR equipment to engineering drawings,
technical manuals and technical/logistical data. The management
information contained in the system is related to tasks under
system management, acquisition, improvement, and distribution.

5.1.2.3.1 SPAWAR - CSA Hardware.

a.   WANG VS 300
b.   WANG PCs
c.   Two WANG 288MB Disk Drives
d.   Dateline 9-track Tape Drive System (1600/625OBPI)

    e.   Two Dateline 288MB Fixed Disk Drives
    f.   Four Dateline 456MB Fixed Disk Drives
    g.   WANG Net Controller
    h.   WANG Terminals and PCs
    i.   IBM PCs via VSCOM Terminal Emulation Software

5.1.2.3.2 SPAWAR - CSA Operating System.

    VS-OS Version 7.14.02 - Wang VS300

5.1.2.3.3 SPAWAR - CSA Software.

    a.   VSCOM used for terminal emulation on IBM PC
    b.   WANG COBOL
    c.   WANGNET LAN
    d.   PACE - RDBM
    e.   PACE - Application Builder
    f.   PACE - Query/Report Generator
    g.   PACE - Host Language Interface

5.1.2.4   SPAWAR - Technical Data Center, Electronic Technical Manual System (TDC-ETMS).

    The TDC-ETMS makes use of workstation and LAN technologies at the SPAWAR TDC Naval Electronics System Engineering Center, Portsmouth, VA. Generally, the functionality supported by the TDC/ETMS is related to tasks under publishing and improvement.

5.1.2.4.1 TDC-ETMS Hardware.

    a.   Xerox Pro Image 7650 Scanner
    b.   Xerox Local Laser Printers
    c.   Xerox File Servers
       -    Xerox 8000 Server
       -    Xerox 8090-310 Server
    d.   Xerox Workstations
       -    Xerox 8000 Workstations
       -    Xerox 6085 Workstations
    e.   Xerox 1/2 Inch Cartridge Tape Drive
    f.   Kurzweil OCR Unit
    g.   Interface via Ethernet to local NPPS facility

5.1.2.4.2 TDC-ETMS Operating System.

    Xerox

5.1.2.4.3 TDC-ETMS Software.

    a.   Xerox Viewpoint Document Editor (for above hardware workstations)

  b.   Xerox Publishing Illustrator (XPI) - Raster editor
  c.   Xerox Document Conversion Software
  d.   Kurzweil Raster-to-ASCII Software
  e.   Software Services
       -    Electronic Filing
       -    Electronic Mail
       -    Software Loader
       -    850/860 Workstation Gateway
       -    Internet Routing
       -    Print Manager
       -    TCP/EP-to-XNS Gateway

5.1.2.5   Enhanced Ships Technical Publications System (E-STEPS).

     The E-STEPS makes use of centralized computing capabilities
under the information processing center maintained by the Naval
Sea Data Support Activity (NSDSA). This system performs a range
of functions. Generally, the functionality supported is oriented
toward providing management information. This management
information is related to tasks under system management,
acquisition, improvement, publishing, and distribution. As a
management information system, over 325 users can access
management data associated with TMs.

5.1.2.5.1 E-STEPS Hardware.

  a.   VAX Cluster (8530's & 11/780)
  b.   VT 100/200 Terminals
  c.   Ethernet LANs
  d.   Britton Lee IDM
  e.   Z-248 or HP PCs
  f.   T-1 Lines
  g.   DDN & SNA Gateways
  h.   MicroVax II
  i.   4 LPS-27 Line Printers
  j.   Dial-up Modems
  k.   2 LPS-40 Line Printers

5.1.2.5.2 E-STEPS Operating System.

  a.   VAX VMS 5.2
  b.   Britton Lee

5.1.2.5.3 E-STEPS Software.

  a.   SmartStar V 5.1
  b.   VAX Basic
  c.   ProCom Plus - Terminal Emulation

5.1.2.6   Modular Specification (M-SPEC) System

M-SPEC System makes use of minicomputer computing capabilities under NSDSA associated with the Naval Sea Systems Command (NAVSEA). The M-SPEC system provides tailored technical manual contract requirements (TMCRS) based on the input of data on the Technical Manual Acquisition Requirements Checklist (TMARC; NAVSEA Form 9086/12). The development of a TMCR makes use of logic built into the M-SPEC system to choose the appropriate technical manual specification from 21 different specifications and standards.

5.1.2.6.1 M-SPEC Hardware.

DEC MicroVax II

5.1.2.6.2 M-SPEC Operating System.

VMS 5.2

5.1.2.6.3 M-SPEC Software.

    a.   Vax Basic
    b.   Fortran

5.1.2.7   Electronic Technical Publishing System (ETPS).

ETPS is based on the ATOS architecture and performs pre-publishing functions for the US Marine Corps. Approximately 80% of the pages produced by ETPS are change pages; 20% of the pages worked involve complete TM revisions. Generally, the functions supported by this system are related to tasks under improve and publishing.

5.1.2.7.1 ETPS Hardware.

    a.   VAX 3600
    b.   RA 82 Disk Drive - 622 Mb
    c.   LA1OO Operators Console
    d.   RA70 Disk Drive
    e.   RK70 Cartridge Tape Unit
    f.   TU 81 Mag Tape Unit
    g.   DEC Server 200
    h.   Ethernet Cabling
    i.   Cygnet Model 1803 Optical Jukebox
    j.   Optimen 2400 Optical Disk Drives
    k.   QLC-1000 Interface
    l.   Optimen 2402 Optical Media
    m.   PC/AT Compatible (640K - 20MB Hard Drive)
    n.   Auto-trol Model AG5522

    o.   Apollo Model DN3500
    p.   Kurzweil 4000
    q.   Xerox 7030 (low-end Kurzweil OCR)
    r.   Auto-trol 36x48 Model Z101 Digitizer
    s.   ANA Tech Model 1760 (C size flatbed scanner)
    t.   ANA Tech Model 1650 (Roll feed scanner)
    u.   QMS-PS 2400 (300 dpi; 24 ppm)
    v.   Varityper Model VT-600 (600 dpi; 4-8 ppm)
    w.   Shaffstall 6000 Media Conversion Unit

5.1.2.7.2 ETPS Operating System.

    a.   VAX, VMS
    b.   PC,/AT MS-DOS

5.1.2.7.3 ETPS Software.

    a.   WriterStation - Datalogics
    b.   PAGER Composition - Datalogics
    c.   Graphics Conversion
    d.   SGML Parser
    e.   Auto-trol Series 5000
    f.   Technical Illustrator - Auto-trol
    g.   RAP-EL (Electronic Schematic) - Auto-trol
    h.   External Access Utilities - Auto-trol
    i.   Postscript Interface - Auto-trol
    j.   ANA Tech Interface - Auto-trol
    k.   Integrated Digitizer Facility - Auto-trol
    l.   ANA Raster to Vector conversion Utilities
    m.   Shaffstall Conversion Utilities
    n.   Comm Network - National Instruments
    o.   VAX/INFO - Database Management System

5.1.2.8 Automated Logistics Publishing System (ALPS).

The ALPS system is comprised of stand alone system nodes installed and operated at various Navy locations, primarily components of the Navy Publishing and Printing Service (NPPS). ALPS systems provide the capability for document editing, composition, maintenance, conversion from hardcopy to digital in ASCII or Image format, conversion of PC and word processing data to publishing formats, and implementing CALS formats, specifically, SGML. They will perform the function of accepting TMs delivered by DoD contractors in digital format. Output includes reproducible material and may include published digital output. The Automated Document Management and Production System (ADMAPS) is a band of the Navy's Computer Aided Design (CAD) II program to establish a contract for acquisition of ALPS system nodes. ALPS acquired through this program can be tailored to the given requirement, and will include expanded storage with

associated Data Base Management System (DBMS), conversion between CAD formats and publishing or imaging formats, and formatting for user automation such as CD-ROM.

5.1.2.8.1 ALPS Hardware.

    a.   286/386 PC(s)
    b.   UNIX Workstation(s)
    c.   Terminals, on-net locally and remote
    d.   File Service (hard disk or optical)
    e.   OCR/ICR Scanner
    f.   Image Scanner (art and large format)
    g.   Media Converter (floppy)
    h.   Proof Printer(s), System (Dot Matrix) Printer
    i.   LAN Cables and connectors (modems)
    j.   Typesetter
    k.   Large format printer/plotter

5.1.2.8.2 ALPS Operating System.

    Normally UNIX and MS-DOS

5.1.2.8.3 ALPS Software.

    a.   Document editing and composition
    b.   File/data base storage manager
    c.   Print Controller
    d.   SGML author/editor
    e.   SGML autotagger
    f.   SGML Output Specification Developer
    g.   SGML Parser
    h.   Data Conversion

5.1.2.9   Navy Advancement Center Desktop Authoring and
          Production System (NACDAPS).

    The NACDAPS is operated by the Naval Education and Training Program Management Support Activity, Pensacola, FL. NACDAPS is used to develop and produce Navy rate training manuals and nonresident training courses. NACDAPS produces new or revised manuals and courses and page changes. The system does not interface with any other system.

5.1.2.9.1 NACDAPS Hardware.

    a.   UNISYS advanced 30386/20 computers
    b.   UNISYS laser printers
    c.   UNISYS 24-pin dot matrix printers
    d.   UNISYS scanners
    e.   Zenith Z-248 30286/8 computers

    f.   Alps P-2000 printer

5.1.2.9.2 NACDAPS Operating System.

     MS-DOS

5.1.2.9.3 NACDAPS Software.

    a.   Wordperfect 4.2 and 5.1
    b.   Ventura Desktop Publisher
    c.   SummaSketch II
    d.   Design CAD
    e.   Harvard Graphics

5.1.3   Air Force Existing Hardware/Software.

5.1.3.1   Automated Technical Order System (ATOS).

ATOS is used as a means to manage the development of reproducible copy, either paper or digital for production and distribution.

5.1.3.1.1 ATOS Hardware.

    a.   WYSE personal computers
    b.   KURZWELL OCR
    c.   AUTOTROL graphics workstations
    d.   ANATECH (APOLLO) workstations
    e.   TRIPLE I scanner, photo typesetter, and laser publisher
    f.   WYSE review workstations
    g.   BP laser publisher
    h.   DEC VAX 111785 central processor
    i.   CYGNET optical disk jukebox

5.1.3.1.2 ATOS Operating System

    a.   DEC VMS
    b.   MS-DOS
    c.   Apollo Domain

5.1.3.1.3 ATOS Software.

Locally developed software using Fortran.

5.1.3.2   Logistics Management of Technical Order System (LMTOS) - Data System Designator G022.

G022 is the sole automated data system for configuration management of Air Force TMs. It is a 1960s data system. It provides output products to the Air Force users relative to the TM use, change and distribution statistics. Reports are

generated from requirements and are either standard reports or
unique reports developed from individual requests.

5.1.3.2.1 G022 Hardware.

AMDAHL

5.1.3.2.2 G022 Operating System.

MVS

5.1.3.2.2 G022 Software.

Locally developed software using COBOL.

5.1.3.3 Automated Technical Order Management System (ATOMS).

ATOMS is a PC based program designed to assist the TO
Distribution Office (TODO). It provides file management to TMs
on-hand, on-order, location, account numbers, and discrepancies.
It is written in either COBOL or dbase II, and compatible to
standard DoD contract purchased machines.

5.1.3.3.1 ATOMS Hardware.

IBM Compatible PC

5.1.3.3.2 ATOMS Operating System.

MS-DOS

5.1.3.3.3 ATOMS Software.

Locally developed software using either COBOL or dbase II

5.1.3.4   Worldwide Keypunch Replacement Program (WKRP).

WKRP is essentially a key-to-disk program designed to be run
on a PC. It provides the 80 column input requirement which is
placed on a floppy disk and delivered to the base level computer
or AUTODIN for transmission of TO requirement data to G022.

5.1.3.4.1 Hardware.

IBM Compatible PC

5.1.3.4.2 WKRP Operating System.

MS-DOS

5.1.3.4.3 WKRP Software.

Locally developed software

5.1.4   Hardware Environment.

The anticipated hardware environment required to support the system must support the functionality described in this FD. General hardware capability requirements include, but are not limited to:

a. Processor

1.   The processor must be capable of multi-tasking and multi-processing.

2.   The transaction processing capability must be sufficient to allow for a 100% workload surge.

3.   The systems must be capable of achieving a graceful shutdown and resume normal processing when a failure has been connected without the loss or corruption of data. The system must support the configuration for redundant paths/components to minimize the single point of failure.

4.   Initially, memory size must support functions required with at least a 50% reserve capacity. Memory must be expandable to accommodate growth.

5. The hardware architecture must be capable of modular expansion through field upgrade in lieu of hardware replacement.

6.   Hardware architecture must be based on open system standards.

7.   Workstation Requirements. The workstations must be capable of supporting all functional requirements dictated by the system/subsystem. A standard workstation should be a full complement, high resolution, graphics workstation configured with its own storage.

b.   Peripherals

1.   Tape Drive. The tape drive must be capable of supporting functional requirements for storage, back-up, and interfaces.

2.   Scanners. Scanners must have the capability to convert hardcopy TMs and related data to digital media.

3.   Printers. Dot matrix, laser, bubble jet, ink jet, terminal and daisy wheel printers must be able to support required publishing functions which include both text and graphic output.

4.   File Server. File server capability may be integral to the central processing unit and its accompanying software. The file server will be interoperable with all equipment it supports.

5.   Optical Media Jukebox. This component must be sized to accommodate functional requirements with expansion to accommodate anticipated growth. All optical media must be based on current International Standards Organizations (ISO)/American National Standards Institute (ANSI) specifications for standard industry sizes.

6.   Typesetter. Typesetters must be able to support photo-ready copy output.

7.   Storage. Storage must be large enough to accommodate the existing TM inventory as well as management information with planned growth of 100%. Sizing must also take into consideration all software that will reside on the system.

8.   Uninterrupted Power Supply. Power must be available from an alternate source to allow continued system operation for a given period of time to allow graceful shutdown of the system.

9.   Communications Servers. The hardware and software providing protocol support functions. A communications server is a community resource which can be accessed by users to gain access to network facilities (circuits). Once a user's authorization is checked, the communications server establishes and manages data transfers between the user and the requested network facility.

10.   Communications Controllers. The hardware and software responsible for managing the physical network facility. A communications controller can handle several types of communications servers. The communications controller provides such transmission functions as: polling, error detection, correction and retransmission, and routing services for a set of communication circuits which are physically attached to the controller.

5.1.4.1   Hardware Environment for Manage TM System (Level 1).

The system required to support TM management should consist

of a computer system that must be capable of operation 7 days a week, 24 hours a day.

5.1.4.2   Hardware Environment for Acquire, Improve, Publish and
           Stock TMs (Level 2).

     The ADS system required to support these functions should consist of a computer system which must be capable of operation 7 days a week, 24 hours a day. The ADS components (e.g., text terminals, graphics terminals, hardware and software suites) will vary depending on the requirements of the, location (e.g., technical content managers, operating commands, or systems commands).

     The capability to process a wide variety of transfer media will be required for various TM data delivery methods. Flexible disks in several industry standard and format sizes, tape cartridges, optical disks, reel tape devices, and paper will be necessary to support these delivery methods.

5.1.4.3   Hardware Environment for Distribute TMs (Level 3).

     This ADS suite must be capable of operation 7 days a week, 24 hours a day. The system will interface with a long-haul communications network as well as the users' local communications network. This system will act as a data distribution node to user systems, such as the Improved Technical Data System (IMS) for the Air Force or the Portable Maintenance Aid (PMA) for the Army.

5.1.4.4   TM Account Holder/User Support/End User Hardware
           Environment (Levels 4 and 5).

     Users will employ the Distribute TMs hardware/software suites and interfaces to receive TMs and TM management data and to submit related TM data (requisitions, change requests, etc.). Support of the local user workstations at the operating and using commands will be through direct linkages. Access to software and system support will be provided through communication nodes at that level.

5.2   Support Software Environment

     This paragraph describes the types of computer software to be included in the ADS. All software will be device independent in support of the flexibility requirements established in the FD and system specifications.

5.2.1   System Level Software.

     The following system-level software is required for the system:

     a.   An electronic mail package to send, receive, store and coordinate messages. The electronic mail package shall also include the capability to provide any terminal in the ADS network with automatic retransmission in the event of communications failures.

     b.   A teleprocessing monitor to support on-line transaction processing and provide interactive sessions with the users.

     c.   A system security package to control system level access.

     d.   Utility functions, integrated with the operating system, that provide automated capability to: 1) manage magnetic tapes and disks; 2) provide automated job scheduling; and 3) provide print product distribution.

     e.   An operating system performance monitor to provide an automated capability for all processors, other than single user PCs, to track resource use of all computer and communications hardware. It must also allow virtual and logic system resources to be monitored by using task. Tracking data logged must include date and time tag. The software must consist of data collection and data reduction components. The data collection component must be run as part of the system start-up procedure to record all system activities. The data reduction component must be able to run in both on-line and batch mode. The software must allow real-time display of operator requests.

     f.   A utility to automatically or upon operator input, create file back ups and to restore, maintain or recover lost or damaged files.

5.2.2   Applications/Utility Software.

     The applications/utility software must be capable of providing the following support:

     a.   Word processing capabilities to support updating and authoring TMs on-line from the ADS data base.

     b.   An output capability to allow reproduction of TMs in paper (publishing) and electronic media (tape, optical disk, etc.).

c.   Graphics and text conversion utilities.

d.   Full text retrieval/indexing utilities.

e.   Statistical package (graphic and spreadsheet) for decision analysis.

f.   COTS software packages and Technical Document management software which is capable of providing:

1.   A Standard Generalized Markup Language (SGML) auto-tagger and text editor/context sensitive data authoring and what-you-see-is-what-you-get (WYSIWYG) viewing at editing sites;

2.   A SGML parser to validate document markup;

3.   An ability to create, import, manipulate, and export text and graphics that comply with MIL-M-28001, MIL-R-28002, MIL-D-28003, MIL-D-28000, and MIL-STD-1840 compliant formats;

4.   On-line delivery software for creation of Read Only documents;

5.   An ability to convert word processing files and OCR/ICR- scanned files to an SGML tagged file;

6.   An ability to secure documents and document sections by user ID.

g.   Programming support tools which are capable of supporting the operations of the ADS. Such tools may include:

1.   Computer-aided Software Engineering (CASE) tools;

2.   Context sensitive editor,

3.   Certified Compilers;

4.   Linker,

5.   Static analyzer,

6.   Dynamic analysis tools;

7.   Configuration manager,

8.   Tool kit to aid in development of graphical user interfaces (GUI);

9.   Interactive debugger, and

10.   Post-mortem analyzer.

h.   The capability to compress data via CALS compliant compress/decompress algorithms.

i.   The capability to encrypt/decrypt data. Must comply with applicable DoD security regulations.

j.   Mainframe, mini and Local Area Network (LAN) security tools.

k.   A capability for document scanning and OCR operation.

l.   A capability for graphics creation and update.

m.   User-friendly menus and screens for on-line interactive queries.

n.   A capability for data format conversion.

o.   Production and management of pageless TMs.

p.   COTS software packages to support development and maintenance of computer based training capabilities and associated courseware.

q.   An automated expert system capability to check TM content data for missing elements, elements out-of-place, reading grade level (RGL) and other errors.

r.   The capability for scanning of halftone and continuous tone images and maintain the gray tonal spectrum of the images.

5.2.3   Data Base Management System.

a.   The data base management system which supports the ADS must have the following characteristics as a minimum:

1.   A data manipulation language which allows application programs to give instructions to the data base management system.

2.   A data base definition language which allows definition of application program views of the data base.

3.   A description language which allows a global logical data description of the data base.

4.   A physical data description language which allows

the data base to be mapped to physical storage.

        5.   Document management imaging and indexing.

        6.   A performance monitor.

        7.   An active Data Dictionary.

        8.   A technical document management system.

        9.   Structured Query Language (SQL) support.

        10. Referential integrity.

        11. An ANSI, ISO compliant data base.

    b.   The ADS data base management system must have the following capabilities:

        1.   Controls to protect against concurrent updates/record lockout.

        2.   Access authorization control down to the data element level.

        3.   Controls and techniques to prevent loss of data during processing or uncontrolled system shutdown.

        4.   Backup and recovery capabilities.

        5.   Journal/audit files containing before and after images of data base records changed by update transactions.

        6.   For automatic "rollback" of data base changes when any transaction or series of related transactions is not successfully processed.

        7. For on-line data base backup for contingency or reporting needs capability without halting other system processing.

        8.   User-friendly menus and screens for on-line interactive queries.

        9.   Deadly-embrace avoidance.

5.2.4   On-Line Query Software.

    The on-line query language provided to support the ADS authorized user must:

    a.   Support interactive, on-line, ad hoc query of data
base information from one or more record types using multiple
keys.

    b.   Permit sorting, manipulation and summarization of
retrieved data for output.

    c.   Permit output to a selected terminal screen or optional
output to a selected publisher.

    d.   Allow formatted queries to be predefined and stored for
execution as required.

5.2.5   Report Generator Software.

    The report generator software provided to support
the ADS (may be a component of the data base management system)
must:

    a.   Permit on-line generation of reports using data
elements as defined search keys.

    b.   Allow formatted reports to be predefined and stored
for execution as required.

    c.   Permit on-fine viewing of reports.

    d.   Permit report down loading to remote computer files.
    e.   Permit printing to support remote sites.

5.2.6   Diagnostics.

    The operational diagnostics for the system will support the
performance of fault and error reporting at the lowest level that
is practical. Error reporting and diagnostic routines will be
required as shown below:

    a.   Standardized error reporting in display of applications
software malfunctions.

    b.   Isolate hardware malfunctions to module.

    c.   Identify hardware/software critical module failures
during processing.

    d.   Provide local communication fault notification.

    e.   Provide hardware loading/usage reporting.

5.2.7   Application Program Languages.

     The system must use Ada as the primary application language.
As such, interface software may have to be developed in order to
support Ada.

5.2.8   Other Software Considerations.

     Software is required to aid in the development, testing,
system debugging/diagnostics, network management training, and
operational phases of the ADS. It must be able to support sorts,
merges, and file comparisons, as well as media conversion, data
compression, and secondary storage management.

5.3 Communications Requirements.

     The ability of DoD units to communicate and transfer TM data
and related management information is critical to the
effectiveness with which these units operate and maintain all
their equipment. Physical media transfer capabilities and
telecommunications networks and network-related interfaces are
critical,to achieve the goals of connectivity, interoperability,
and total integration of components. Communications apply to
continental United States (CONUS), overseas locations, and with
DoD contractors involved with TM development. The software for
sending/receiving TMs, electronic mail, file transfer, etc., must
be fully interoperable across all hardware/software sites. DoD
communications capabilities supporting the joint TM system
implementation fall into three categories:

     a.   Long-haul telecommunications. Service implementations
of the system will use existing and planned DoD standard
telecommunications capabilities, such as AUTODIN, DDN, Defense
Commercial Telecommunications Network (DCTN), and the Federal
Telephone Service (FTS) 2000, whenever practical and feasible.
DoD is in the process of migrating the AUTODIN message data
traffic to the MILNET portion of the DDN. The use of AUTODIN for
message traffic should only be used when an end-to-end electronic
file transfer utilizing DDN as the primary means for long-haul
communications is not available. If DoD capabilities are
inadequate or unavailable, commercial communications capabilities
will be used.

     b.   Local telecommunications. Local telecommunications
requirements will be satisfied using a variety of existing and
planned telephone plant and equipment and local area networks.

     c.   Bulk data distribution capability employing magnetic or
optical media will be employed for transferring data and
information between sites whenever use of long-haul or local

telecommunications capabilities is impractical or not feasible.

5.3.1   Communications Network Concept.

        The different levels that perform TM system activities in
management, acquisition, improvement, and distribution of TMs
must be able to communicate with each other. Communications
required will be a combination of long-haul and local
capabilities.

        DoD organizations will be connected within a network capable
of sustained transfers of digital text and graphics files. These
files could consist of database transfers and transactions and
digital transfers of complete or portions of TMs in a variety of
digital formats including: files consisting of data in American
Standard Code for Information Interchange (ASCII) text,
Consultative Committee on International Telephony and Telegraphy
(CCITT) Group 4 (raster), Initial Graphics Exchange Specification
(IGES) and Computer Graphics Metafile (CGM) vector formats and
combinations thereof.

5.3.2   Communications Interfaces (Hardware, Software, Media,
           etc.).

        The ADS must be able to communicate freely between nodes.
The required communications network must be Government Open
Systems Interconnection Profile (GOSEP) compliant.
Communications considerations include:

        a.   Development of inter-site gateway requirements.

        b.   Preparation of standards for user system interfaces.

        c.   Establishment of requirements for communications
equipment and media, such as modems, network interface units,
computer interface units and other equipment necessary to provide
system telecommunications networks.

5.3.3   Communications Protocols.

        The ADS will employ the following specifications and
standards to ensure interoperability and connectivity:

        a.   Internet Protocol (IP), MIL-STD-1777.

        b.   Transmission Control Protocol (TCP), MIL-STD-1778.

        c.   File Transfer Protocol (FTP), MIL-STD-1780.

        d.   Simple Mail Transfer Protocol (SMTP), MIL-STD-1781.

e.   TELNET Protocol, MIL-STD-1782.

f.   DDN Standard X.25, Packet Switching Protocol, Federal Information Processing Standard Publication (FIPS Pub) 1OO/FED-STD-1041.

g.   Ethernet/IEEE 802.3 interface.

5.3.4   Data Network Transactions.

The ADS will be designed to meet the modernization initiative of the Office of Secretary of Defense (OSD) Modernization of Defense Logistics Standard Systems (MODELS) and use a variable-length format. Variable-length formats will incorporate the syntax and standards of ANSI 12 for Electronic Data Interchange (EDI). The ADS will comply with Portable Operating System Interface for Computer Environments (POSIX).

5.4 Interfaces.

5.4.1   Types of Interfaces

In order for TMs and TM data to be most efficiently utilized, there are interfaces that are required These interfaces have been defined as the following four distinct types:

Type 1 - Interfaces that require periodic or scheduled transfer of data as well as the updates to that data from one system to another.

Type 2 - Interfaces that support ad hoc retrieval of data and information from a host system and subsequently transferred to a pest system. The original data is used in a new product, with or without modification.

Type 3 - Interfaces that support updates of data and information by users not resident on the host system. The information is retained on, maintained by, and used on the host system.

Type 4 - Interfaces that support view-only access to data and information. The information does not leave the host system.

An analysis will be conducted on each of the identified systems to determine the Type (or Types) of interfaces required.

5.4.2   Existing/Planned Systems.

The ADS must be able to interface with existing or planned systems. As a minimum, the following interfaces are required.

5.4.2.1   Army Existing Systems.

     The following six systems will interface with the joint TM
system. These systems will continue to operate as they do today.

     Software will be developed to fulfill each interface
requirement. The system must be able to send TM data to as well
as receive TM data from these systems. The system side of each
interface will be developed by the development contractor and
funded by the Program Management Office (PMO). Funding for the
Army side of each interface is to be determined; however, the
responsibility for development of such interfaces will be levied
on the Army.

5.4.2.1.1 Commodity Command Standard System (CCSS).

     CCSS is operated by the U.S. Army Information Systems
Command's System Integration and Management Activity (SIMA) in
St. Louis, MO. CCSS contains publications-related repair parts
data from Logistics Support Analysis Records (LSAR). Each MSC,
however, maintains its own CCSS on the IBM platform available at
that MSC. The data resident on each CCSS is unique to the
equipment/systems maintained by each MSC. CCSS processes TM-
specific LSAR data. Logistics Support Analysis (LSA) is a
process that applies to all DoD acquisition processes. MIL-STD
1388-IA implements LSA guidelines and requirements established by
DODI 5000.2 and DODI 5000.39. LSAR provides a uniform, yet
flexible technical data base which consolidates the engineering
and logistics data necessary to identify the detailed logistics
support requirements of a system. Industry uses MRSA certified
software packages on a variety of hardware platforms to collect
and compile this data for delivery.

5.4.2.1.2 Army Computer-aided Acquisition and Logistics Support
          (ACALS).

     ACALS is part of a DoD and industry initiative to provide an
evolutionary modernization of the process for the capture,
storage, and processing of logistics technical information (both
weapon system hardware and software) required for system
acquisition, design, manufacture, and support.

     The U.S. Army Implementation Plan for CALS states: "The
Army's CALS program will tie together existing and evolving
islands of automation (IOA) into an integrated capability that
will totally automate the Army's processing of technical and
logistics support information."

5.4.2.1.3 Standard Finance System (STANFINS).

STANFINS is used throughout the Army to plan, program, budget, disburse, and account for funds used in day-to-day operations. STANFINS interfaces supporting the effort will be used by appropriate resource management offices to plan, program, budget, disburse and account for contractual and organic publications production funds.

5.4.2.1.4 Digital Storage and Retrieval Engineering Drawing
        System (DSREDS).

DSREDS is an automated data system designed to capture, store, revise, retrieve, and distribute engineering data in automated form. Engineering data can include over fifty types of documents representing a part assembly. DSREDS combines the technologies of digital imaging and optical mass storage with the technologies of multiprocessing, data base management, virtual storage, and telecommunications into an integrated document management system. DSREDS is currently not capable of input or output of engineering data which is fully compliant with CALS standards for raster data, but it is planned to incorporate those capabilities by June 1991. DSREDS consists of twelve subsystems grouped in four functional areas.

5.4.2.1.5 Logistics Planning and Requirements
        Simplification (LOGPARS).

The LOGPARS system is a personal computer based Integrated Logistics Support (MS) expert system which leads an ILS manager through the thought process necessary to plan and execute an ILS program. LOGPARS incorporates the required policy, lessons learned, and experts' experience to produce critical ILS program and contractual documentation. LOGPARS is a designated Joint Logistics Commanders (JCL) standard system and is part of the CALS testbed.

5.4.2.1.6 Army Central Logistics Data Bank (ACLDB).

The ACLDB, which is maintained at and by the USAMC Catalog Data Activity (CDA), serves as the focal point for nonquantitative logistics management data in support of Army logistics operations. The data bank maintains information on approximately 1.2 million supply items managed or used by the Army. The data contained in the ACLDB is required by the Army for the proper management of items throughout their lifecycle. This includes procurement, storage, requisitioning, packaging, transportation, use, maintenance and disposal. The data bank is updated monthly via input from eleven separate file originators. All input is prepared and submitted in accordance with AR 708-1.

As the organization ultimately responsible for data published and distributed to the field from the ACLDB [more notably via the Army Master Data File (AMDF) and the Remote Terminal AMDF Inquiry System (RTAIS)], CDA performs various front end edits on data submitted in order to ensure correctness and compatibility. Input data that does not meet the criteria set forth in AR 708-1 is returned to the appropriate originator for review and resubmission under the AMDF Reject and Notification program. Further, CDA constantly monitors data already resident in the ACLDB. The AMDF Surveillance and Purification Subsystem provides file originators notification of incompatible and/or inconsistent relationships on this resident data.

CDA also acts as the Army focal point for the development, management and coordination of a wide variety of DoD and Army logistics programs such as the Defense Logistics Information System (DLIS) and the cataloging portion of the Commodity Command Standard System (CCSS).

5.4.2.1.7 TRADOC Decision Support System (TDSS).

The TDSS is a network at TRADOC sites that is attached to the Training Module OD), and the Automated Systems Approach to Training (ASAT). Information, such as target audience descriptions and comments on Preliminary)Draft TMs is entered into ASAT, passed through and consolidated in the TRAMOD, and would be passed through the TDSS to enter into the system. The joint TM system would need to pass data in the reverse direction to communicate with TRADOC users.

5.4.2.1.8 Army Master Data File (AMDF).

AMDF data includes a cross reference that relates the LIN assigned to each Army weapon/system to the NSN and official nomenclature. It also has the NSN and official nomenclature of all Army-adopted repair parts. The AMDF is produced by U.S. Army Materiel Command's Catalog Data Activity at New Cumberland Depot, New Cumberland, PA. AMDF data is provided to the Materiel Readiness Support Activity (MRSA) in the form of a monthly update tape and is used to update the AMC MRSA EOPDB baseline. The EOPDB updates pick up changes in Federal Supply Classes (FSC) and nomenclatures and also produce a list of dropped NSNs used to initiate rescission reviews of affected technical manuals (TMs).

5.4.2.1.9 Mater Cross-Reference last (MCRL).

MCRL data includes NSNS, reference/part numbers and corresponding Commercial and Government Entity (CAGE) codes which identify the manufacturer of each reference/part-numbered item. The MCRL is produced by Defense Logistics Support Center (DLSC),

Battle Creek, MI, in microfiche and CD-ROM formats. MRSA uses
MCRL data to update the EOPDB whenever a new NSN is assigned to a
reference/part and to help field users identify applicable TMs
whenever only reference/part numbers are available. As yet,
there is no automated interface between DLSC and MRSA, so MCRL
updates to EOPDB are generated manually.

5.4.2.2   Army Planned System - Phased Arrayed Tracking Radar
           Intercept Onto Target (PATRIOT) Automated Logistics
           System (PALS).

     PALS falls outside the PM Text, Measurement and Diagnostic
Equipment (TMDE) arena as it covers type B+ technical manuals.
It will see a limited fielding in the third quarter of fiscal
year 1991.

5.4.2.3   Navy Existing Systems.

5.4.2.3.1 Technical Manual Publish on Demand System (TMPODS).

     TMPODS is a Navy system which is currently in source
selection. For the most part, this system is a print-on-demand
system which performs functions outside the system. For the
Navy, however, there is an important relationship that must be
supported between the system and TMPODS. This relationship is
primarily an interface relationship. Generally, although print-
on-demand is outside the system, the TMPODS will perform other
functions which are similar to the system. These include the
digital storage and distribution of TMs.

5.4.2.3.2 Automated Printing and Retrieval System (APARS).

     APARS is a test site for the TMPODS and is primarily devoted
to document search/retrieval and print-on-demand functions. As
with TMPODS, there is an important relationship that must be
supported between the system and APARS. This relationship is
primarily an interface relationship. Generally, although print-
on-demand is outside the system, the APARS performs other
functions which are similar to the system. These include digital
storage and distribution.

5.4.2.3.3 SPAWAR TDC-CSA.

     The CSA is under the information processing center
maintained by the SPAWAR Technical Data Center Naval Electronic
Systems Engineering Center at Portsmouth, VA. Generally, the
functionality supported is oriented towards providing management
information for products managed by SPAWAR. Major functions
include: maintaining SPAWAR equipment configuration baseline, TM
numbering assignments, TM deficiency analysis, repository

functions, and providing a master index/locator of SPAWAR equipments to engineering drawings, TMs and technical/logistical data. The management information contained in the system is related to tasks under system management, acquisition, improvement, and distribution.

5.4.2.3.4 Engineering Data Management Information and Control
          System (EDMICS).

        EDMICS is currently in development in Louisville, KY. As an on-going development effort to support the receipt, storage, and distribution of engineering data from a digital data base, the EDMICS is making use of a number of system technologies which parallel those which will be used under the system. Although similar technologies are to be used, the primary relationship between the EDMICS and the joint TM system is an interface relationship.

5.4.2.4   Navy Planned System – Shipboard Non-Tactical ADP
          Program (SNAP).

        SNAP III will be the single shipboard Automated Information System (AIS) of the future. It will replace SNAP I/II systems as well as provide common hardware to the Naval Aviation Logistics Command Management Information System (NALCOMIS) program and is designed to explore and implement the paperless ship initiative (PSI). SNAP III will also incorporate the standards called out by the CALS initiative; it will use advances in DoD technical information and information resource management. SNAP III will provide the capability to retrieve, display, and print-on-demand various engineering and logistics support data as made available from shore support systems. Generally, the functionality supported by the SNAP III is outside the scope of the system. The SNAP program as it relates to technical manuals is confined to the digital storage and read only display of technical manuals/information.

5.4.2.5   Air Force Existing Systems.

5.4.2.2.1 Security Assistance Technical Order Data System
          (SATODS).

        SATODS was developed to control the releasability of all TOs to foreign countries which participate in the Security Assistance Program (SAP). Air Force TOs are included in this process and comprise 80% of the records which are controlled for release by SATODS.

5.4.2.5.2 Core Automated Maintenance System (CAMS).

The ADS must be able to interface with CAMS. The interface with CAMS, and any other standard small/multi-user computer system, must be a standard interface and address physical interface requirements, logical interface requirements, and data access to allow for smooth operation, and modular replacement.

5.4.2.5.3 Computer Program Identification Numbering System (CPIN).

The CPIN system is a centralized data system for assigning and controlling CPINS. CPINs are identifiers for a Computer Program Configuration Item (CPCI). A CPCI consists of a single computer program or a group of computer programs, which satisfies an end user function.

5.4.2.6   Air Force Planned Systems.

5.4.2.6.1 Joint Surveillance and Tracking Attack Radar System (JSTARS).

Technical manuals to be used in support of the JSTARS are being embedded into a computerized system to allow access by the system operators during operations. The intent of the Computerized Technical Order System (CTOS) for the JSTARS is to automate the storage and presentation of maintenance TMs and integrate their use with on-board diagnostics to support maintenance of the JSTARS primary mission equipment (PE). CTOS will provide the JSTARS PME TMs in an automated display through an on-board workstation in response to operations requests.

5.4.2.6.2 Paperless LANTIRN Automated Depot (PLAD) Computer Based Technical Order System (CBTOS).

PLAD includes an automated TM system, CBTOS, used in conjunction with Low Altitude Navigation Infrared for Night (LANTIRN). The system is primarily computer aided test stations with the capability to access digital TM information on the test station terminals. The system utilizes type B+ digital data with SGML tags down to the paragraph and sentence structure level. The software used for PLAD was development by the Warner-Robins Air Logistics Center (ALC) to support the maintenance of LANTIRN. It is FORTRAN based and designed specifically to support the peculiar LANTIRN system.

5.4.2.6.3 Improved Technical Data System (ITDS).

ITDS is a planned system in support of the B-2 that will electronically deliver TM data to a user. It will provide:

a.   A computerized TM library, known as an ITDS Local Library;

b.   A series of Network Delivery Devices (NDD) (file servers) with multiple workstations connected via a LAN to the ITDS Local Library;

c.   Portable Delivery Devices;

d.   A battery operated, deployable data storage device similar in function and capacity to the Local Library and referred to as the Extended Memory Model (EMM).

5.4.2.6.4 Advanced Tactical Fighter (ATF) Integrated Maintenance
         System (AIMS).

The AIMS is an ATF initiative to acquire, distribute and manage all technical maintenance and product definition information for the ATF in a digitized, integrated, and task-oriented format. The ATF System Program Office (SPO) will procure an ATF master data base from the contractor. The AIMS User System will contain hardware/software elements to enable its interface with the system. The user system will accept responsibility for, and management of, the ATF data base. It will continue responsibility through its delivery to, and use by, AIMS authorized users who require access to ATF technical information in the performance of their jobs and for training purposes.

5.4.2.6.5 C-17 G-File User System (GFUS).

GFUS is an advanced automated technical data system which provides the capability for utilizing paperless TMs, consisting of text, graphics, illustrations, or various combinations thereof, and present it to the system user by a print-on-demand capability in support of task performance in all environments where G-File technical information is used. The system shad function as an area which permits use by the maintenance personnel in the air and on the ground.

5.4.2.7   Tri-Service Planned System - Portable Maintenance Aid
          (PMA).

The PMA is an electronic device used by maintenance technicians to help detect, diagnose faults and present weapon system/subsystem technical information. It is a micro processor controlled device that provides the man-machine interfaces required to direct maintenance technicians to accomplish a repair with a high probability of success within a minimum allotted time. In addition, the use of a PMA will require minimum

training through standard presentation of the Interactive
Electronic Technical Manuals (IETMs). The PMA display screen
provides the operator with direction and status of a required
test routine while the key board/key pad allows interaction with
the test program and/or IETM. The PMA also serves an instrument
or bus controller interfacing directly with the weapon system or
test instruments to speed up a diagnosis and eliminate human
error. It will also be able to upload, download and verify
weapon system software. It will be usable in all the battlefield
environments where electronic type maintenance can normally be
performed. All services are planning implementation of PMAs on
various weapon systems.

5.5   Summary of Impacts.

     The implementation of the system will have significant
automatic data processing impact. This section identifies
projected impacts; additional impacts will be identified as the
system is defined and developed.

5.5.1   ADP Organization Impacts.

     The system will take over functions and workload from
existing computer systems. There will be a gradual shifting of
positional responsibilities for system operations from existing
systems to the ADS. This shifting will be completed by Full
Operational Capability (FOC). The modular shifting of ADS
responsibilities will necessitate some retraining of personnel to
operate the ADS.

5.5.2   ADP Operational Impacts.

     The ADS system administrator will be responsible for
hardware and software support, including problem diagnosis and
resolution, and for performing modifications and updates.

     The ADS operations will be conducted primarily with new
equipment, system software, and operating procedures. The type
and scheduling of workloads will change. Also, the ADS on-line
ad hoc query capability will change the way the organizations
respond to customer needs. For example, instead of using batch
processing for standard demand reports, many users will generate
their own requests for standard and ad hoc reports. Users may
pass complex data requests on to the ADS system administrator.

     The system will be menu driven and user friendly. The user
will be guided through the system using menus that access
functional applications. Entering information into the system
will be simplified by context sensitive on-line help aids that
support functions being performed. All the data needed by the

user will be contained in the data bases. Required subsystem
interfaces for functional applications will be transparent to the
user. Computer based training (CBT) will be provided that is
both keyed to the application software and integrated with it.

5.5.3   ADS Development Impacts.

     The ADS may require new hardware and software. Development
of interfaces to existing systems and their integration will
necessitate increased contact with current system programmers and
managers for developmental support. Time schedules will be
developed for converting paper TMs and non-CALS-compliant digital
formats and existing management data for implementation in the
system. The conversion of existing management data must also be
accomplished. The old hardware and software, will be used until
all data is converted to the new system. Space requirements for
new hardware will be addressed. The system will be installed and
tested at each of the identified sites. Test data will be
derived to test the full range of functionality required by each
site.

5.6 Failure Contingencies.

     Failure contingencies must consider the world-wide TM
distribution to the user community. System design must provide
for recovery from partial and complete system failures, allow for
recovery to the last check point or safety dump, and be able to
recover the data input during the system down time. System
maintenance should be performed in a manner transparent to the
users - not affecting availability.

5.6.1   Restart.

     In the event of failures, the ADS fallback will transfer the
functional responsibilities from one operational location to
another until the failed system element is brought back on-line.
Recovery of the failed units will be accomplished as quickly as
possible. When the system is restarted, each user will be able
to pick up operations from the last check point or safety dump.

     Restart/recovery will contribute significantly to the ADS
availability and data base integrity by using backup, e.g.,
tapes/discs and audit trail data to recover from system failures
at any system site. Data input during system down time can be
redirected to the contingency site for processing, or can be
saved and processed after the system returns to normal
operations.

5.6.2   Fallback.

    If the ADS is not operational or problems with
communications lines occur, queuing, spooling, transaction
logging and messaging techniques will be used to aid in fallback
recovery. Fallback is anticipated to be a two phased situation;
(1) fallback which is related to local ADS hardware or software
problems and (2) fallback which is related to communications
problems. Each must be treated separately. Unavailability of
the ADS to users due to hardware or software problems cannot be
resolved by queuing unless they are communicating via interfacing
systems. In this case, the interfacing system must queue and
poll the ADS until availability is restored. If the
communications link is unavailable, the ADS must accomplish the
queuing and polling. In both cases, transaction editing must be
accomplished by the host ADS.